SUPPLY CHAIN MANAGEMENT AND WARE HOUSING

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PREFACE

In this project we undertook a detailed study of supply chain management and warehousing along with all its practical aspects. We gained more insight into the supply chain process by studying the supply chain management process of PAKISTAN TOBACCO COMPANY (PTC).

Head Of The Department

Instructor:

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Supply chain management

Supply chain management (SCM) is the process of planning, implementing, and controlling the operations of the supply chain as efficiently as possible. Supply Chain Management spans all movement and storage of raw materials, work-in-process inventory, and finished goods from point-of-origin to point-of-consumption. The definition one American professional association put forward is that Supply Chain Management encompasses the planning and management of all activities involved in sourcing, procurement, conversion, and logistics management activities. Importantly, it also includes coordination and collaboration with channel partners, which can be suppliers, intermediaries, third-party service providers, and customers. In essence, Supply Chain Management integrates supply and demand management within and across companies.

Some experts distinguish Supply Chain Management and logistics, while others consider the terms to be interchangeable.

Supply Chain Management is also a category of software products.

Supply chain event management (abbreviated as SCEM) is a consideration of all possible occurring events and factors that can cause a disruption in a supply chain. With SCEM possible scenarios can be created and solutions can be planned.

Supply Chain Management Problems

Supply chain management must address the following problems:

- Distribution Network Configuration: Number and location of suppliers, production facilities, distribution centers, warehouses and customers.
- Distribution Strategy: Centralized versus decentralized, direct shipment, Cross docking, pull or push strategies, third party logistics.
- Information: Integration of systems and processes through the supply chain to share valuable information, including demand signals, forecasts, inventory and transportation etc.
- Inventory Management: Quantity and location of inventory including raw materials, work-in-process and finished goods.
- Cash-Flow: Arranging the payment terms and the methodologies for exchanging funds across entities within the supply chain.

Supply chain execution is managing and coordinating the movement of materials, information and funds across the supply chain. The flow is bi-directional.

Activities/functions

Supply chain management is a cross-functional approach to managing the movement of raw materials into an organization, certain aspects of the internal processing of materials into finished goods, and then the movement of finished goods out of the organization toward the end-consumer. As organizations strive to focus on core competencies and becoming more flexible, they have reduced their ownership of raw materials sources and distribution channels. These functions are increasingly being outsourced to other entities that can perform the activities better or more cost effectively. The effect is to increase the number of organizations involved in satisfying customer demand, while reducing management control of daily logistics operations. Less control and more supply chain partners led to the creation of supply chain management concepts. The purpose of supply chain management is to improve trust and collaboration among supply chain partners, thus improving inventory visibility and improving inventory velocity.

Several models have been proposed for understanding the activities required to manage material movements across organizational and functional boundaries. SCOR is a supply chain management model promoted by the Supply Chain Management Council. Another model is the SCM Model proposed by the Global Supply Chain Forum (GSCF). Supply chain activities can be grouped into strategic, tactical, and operational levels of activities.

Strategic

- Strategic network optimization, including the number, location, and size of warehouses, distribution centers and facilities.
- Strategic partnership with suppliers, distributors, and customers, creating communication channels for critical information and operational improvements such as cross docking, direct shipping, and third-party logistics.
- Product design coordination, so that new and existing products can be optimally integrated into the supply chain, load management
- Information Technology infrastructure, to support supply chain operations.
- Where-to-make and what-to-make-or-buy decisions
- Aligning overall organizational strategy with supply strategy.

Tactical

- Sourcing contracts and other purchasing decisions.
- Production decisions, including contracting, locations, scheduling, and planning process definition.
- Inventory decisions, including quantity, location, and quality of inventory.
- Transportation strategy, including frequency, routes, and contracting.
- Benchmarking of all operations against competitors and implementation of best practices throughout the enterprise.
- Milestone payments

Operational

- Daily production and distribution planning, including all nodes in the supply chain.
- Production scheduling for each manufacturing facility in the supply chain (minute by minute).
- Demand planning and forecasting, coordinating the demand forecast of all customers and sharing the forecast with all suppliers.
- Sourcing planning, including current inventory and forecast demand, in collaboration with all suppliers.
- Inbound operations, including transportation from suppliers and receiving inventory.
- Production operations, including the consumption of materials and flow of finished goods.
- Outbound operations, including all fulfillment activities and transportation to customers.
- Order promising, accounting for all constraints in the supply chain, including all suppliers, manufacturing facilities, distribution centers, and other customers.

Supply chain business process integration

Successful SCM requires a change from managing individual functions to integrating activities into key supply chain processes. An example scenario: the purchasing department places orders as requirements become appropriate. Marketing, responding to customer demand, communicates with several distributors and retailers, and attempts to satisfy this demand. Shared information between supply chain partners can only be fully leveraged through process integration.

Supply chain business process integration involves collaborative work between buyers and suppliers, joint product development, common systems and shared information. According to Lambert and Cooper (2000) operating an integrated supply chain requires continuous information flows, which in turn assist to achieve the best product flows. However, in many companies, management has reached the conclusion that optimizing the product flows cannot be accomplished without implementing a process approach to the business. The key supply chain processes stated by Lambert (2004) are:

- Customer relationship management
- Customer service management
- Demand management
- Order fulfillment
- Manufacturing flow management
- Supplier relationship management
- Product development and commercialization
- Returns management

One could suggest other key critical supply business processes combining these processes stated by Lambert such as:

a. Customer service management
b. Procurement
c. Product development and commercialization
d. Manufacturing flow management/support
e. Physical distribution
f. Outsourcing/partnerships
g. Performance measurement

Supply Chain Management: The Linchpin of M&A

After several years on the back burner, mergers and acquisitions are back in the headlines. Banking, pharmaceuticals, and electronics and high tech currently lead the charge. Most insiders think the trend will only grow larger, given companies' growing need for access to emerging markets, the ever-increasing value they ascribe to economies of scale, and the more favorable M&A regulations now prevalent in many countries.

But how successful will those deals be? No one knows for certain, but it is clear that M&A-related success is far from guaranteed. Consider the results of an Accenture survey of more than 600 business executives involved in their companies' mergers or acquisitions. It revealed that only 45 percent of respondents believe their most recent deal achieved expected cost-saving synergies. From another research study, Accenture found that customers may also be less satisfied after a merger. Even well-managed deals can be better for the participating companies than they are for the participating companies' customers.

What tends to be the difference between deals that work for the participating companies and their customers and those that don't? Another Accenture study points clearly to the supply chain. Querying more than 150 supply chain and non-supply-chain managers, we determined that two-thirds (67 percent) think their companies' recent M&A activities were the cause of increased product-launch disruptions. Furthermore, 62 percent reported that mergers resulted in a loss of talent from their supply chain organizations. Other supply chain problems cited by this group included:

- Diminished product or service quality (cited by 53 percent)
- Problems with order-fill rates (52 percent)

- Stock-outs (46 percent)
- Inventory build-ups (44 percent)
- Increases in supply disruptions (36 percent)

The research initiative also sought to glean the most important cause of these problems. A wide range of answers emerged, but the most common was "insufficient involvement of the procurement and supply chain organization during the pre-closing period." Many respondents explained that, during their merger-integration efforts, senior management chose to focus primarily on cost savings and ended up paying too little attention to supply chain metrics such as quality, inventory turns and order-fill rates. The principal reason, respondents said, was the belief that supply chain issues could be handled later in the merger process.

Accenture's research and client experience has shown that this is a grave misconception. In fact, early involvement of senior supply chain executives in the merger planning process is considered to be among the most critical considerations in ensuring M&A success. Based on our research and work with clients across industries, we have found that the supply chain often accounts for 30 percent to 50 percent of the savings a merger or acquisition ultimately generates. It's the last thing companies should ever postpone or overlook.

Recognizing that the supply chain plays a critical role in the success of any deal—and indeed is fundamental to achieving high performance of the expanded company—can help ensure that the transition in this functional area goes smoothly. The importance of supply chain to M&A success is supported by Accenture's ongoing research into the characteristics of high-performance businesses. Our research confirms that supply chain excellence is directly tied to a company's financial performance, which is why top performers incorporate supply chain management into their business strategies. Mastery of core competencies like supply chain management is a critical component that separates high-performance businesses from the rest of the pack.

Integrated Supply Chain Management

Supply Chain Management is a proven business strategy that has gained wide acceptance in recent years due to increasing customer demands for quality, delivery, and speed. Increased speeds of communicating coupled with cost reduction and more interdependent supplier, provider, and customer relationships have accelerated the integration of supply chains on a wide-spread basis.

Supply chains can exist in both manufacturing and service organizations, and they are principally concerned with the flow of products and information between supply chain member organizations (procurement of materials, transformation of materials into finished product, and distribution of that product to end customers). Today's information-

driven, integrated supply chains are enabling organizations to reduce inventory and costs, add product value, extend resources, accelerate time to market, and retain customers.

The Impact

When applied in the private sector, supply chains have demonstrated superior customer responsiveness at about half the cost. Industry experts estimate that supply chain costs approach 75% of an organization's total operating budget. Effective management of the supply chain not only improves the flow of materials from the perspective of the end user, but it also reduces logistics costs.

In the public sector, integrated supply chains play a critical role in optimizing logistics support and in improving management of secondary inventory. Secondary items include reparable parts (expensive items such as hydraulic pumps and navigational computers that can be fixed and used again); spare parts that support weapons systems; and commodities such as subsistence, medical materiel, and clothing. DoD logistics systems, often referred to as the "logistics pipeline" or "supply chain," involve several interrelated activities that play a role in providing parts where and when they are needed. These activities include the purchase, storage, repair, and distribution of parts, including consumable components that are used to fix reparable parts and end items such as ships and aircraft. All of these activities require substantial capital investments in personnel, equipment, facilities, and inventory.

The Benefits of Supply Chain Management

Effective supply chain management can impact virtually all business processes, leading to continuous improvements in areas such as data accuracy, reductions in operational complexity, supplier selection, purchasing, warehousing, and distribution. Other benefits include:

- Improved delivery performance—quicker customer response and fulfillment rates
- Greater productivity and lower costs
- Reduced inventory throughout the chain
- Improved forecasting precision
- Fewer suppliers and shorter planning cycles
- Improved quality and products that are more technologically advanced
- Enhanced inter-operational communications and cooperation
- Shortened repair times and enhanced equipment readiness
- More reliable financial information.

Recognizing Interdependencies

The Government Accounting Office (GAO) has noted that efforts to reengineer a logistics system are more successful when various logistics activities are viewed as a series of interconnected processes rather than isolated functions. Changes in one element of the supply chain are likely to affect the cost and/or performance of other processes. For

instance, when an airline modifies the way it purchases parts from suppliers, it must consider how those changes might affect mechanics in repair workshops.

Failure to account for all the processes in a supply chain can have negative repercussions across business areas. For example, inaccurate customer forecasts for depot level reparables can affect a variety of process areas, including supply management, transportation, distribution depots, and depot maintenance. In an integrated supply chain, there is coordination among the different players—rather like a relay team, where each player is correctly positioned for the handoff.

The Navy has identified four interrelated cycles in its supply chain:

1. Planning—includes forecasting demand for items, and supply and distribution planning.
2. Sourcing—includes identifying sources of inventory to support acquisition, repair, and other services.
3. Delivery—involves ordering, storage, and transportation.
4. Maintenance—includes repairing weapon systems and component parts.

Understanding the Process

The term "supply chain" first appeared in literature as an inventory management approach. Commercial businesses had been encountering a demand for greater levels of responsiveness and shorter cycle times for delivery and inventory of goods and services (placing, preparing, storing, and fulfilling orders). The notion of "the perfect order" required that the supply chain provide non-standardized, quality products quickly and efficiently every time. Since holding of inventories can cost as much as 40% of their value, their efficient management is crucial.

As with any business process, supply chain management can benefit from the principles of reengineering. Organizations must thoroughly understand how their existing supply chain works, the processes of their suppliers, and the needs of their customers; and establish a performance measurement system after reengineering has occurred.

Common supply chain performance areas:

- Products and services
- Sales
- Cost
- Responsiveness
- Customer service
- Quality
- Delivery
- Cycle times
- Assets utilized
- Warehousing.

Cycle Times

A key aspect of supply chain management is cycle time. Cycle time refers to the total time required to complete a process. A number of factors can impede cycle time: redundant steps; activities that may have been in place for a long time but no longer add value; activities that are done consecutively rather than in tandem; ineffective or poorly used technology; excessive bureaucracy (procedures, controls, and forms that stagnate the process); and poor communication, coordination, and cooperation.

Customer Wait Time (CWT), also called Logistics Response Time, is a specific cycle related to the time from when a customer orders an item until it is delivered (filling a requisition). A high-level metric that can drive improvements through the supply chain, CWT is an effective performance measure for various logistics processes. It looks at what is stocked locally, what is stocked elsewhere, how long it takes to repair or procure items not in stock, how long it takes to ship material, how long it takes to receive shipments, and other factors.

When cycle times are reduced, it can mean less inventory, rework, and overhead—all of which directly impact an organization's overall cost structure.

Improving cycle times

The following have been identified as ways to improve cycle times:

- Use the Internet to expedite and track requisitions
- Use single contractors, rather than many
- Reduction of the amount of secondary items in the pipeline
- Select "prime vendors" or "virtual prime vendors" who can provide market-ready or commercial supplies to a wide range of customers
- Use "business case analysis" (comparing the costs and benefits of the current logistics support process with the estimated cost and benefits of the proposed alternative approaches) to select sources for long-term total life-cycle support (development, production, operational support, and disposal)
- Use activity-based costing analysis to determine areas within the organization that could benefit from reengineering.

Velocity Management

Under its traditional approach to logistics, the Army kept vast quantities of supplies—spare parts, ammunition, vehicles, etc.—on hand "just in case" they were needed. But stockpiling is no guarantee that combat forces will get what they need when they need it. Since 1995, the Army has been using a logistics technique called "velocity management," which emphasizes velocity over mass, quality over quantity.

Velocity management improves the speed and accuracy with which materials and information flow from providers to users. The Army has seen velocity management improve a variety of processes, including:

- Expedited deliveries
- Shortened repair times
- Smarter stocking of inventory
- Increased equipment readiness.

The Role of Information Technology

Information and communications technologies are revolutionizing the scope and scale of e-supply chain infrastructures. Online data exchange is transforming business practices, allowing managers to capture and track complex data more effectively. Orders and various products related to that order can easily be traced. It also is possible to exchange information among entities within the value chain, thus greatly improving customer-provider relationships.

It is important that systems be designed to enhance open and rapid communication and sharing of information across the supply chain and within the organization. Intelligent application of information technology also can eliminate duplicative data entry, provide real-time status information, and help organizations move past a myopic view of their processes to view themselves within the context of larger missions and goals.

Supply Chain Planning

Balance Supply and Demand by Optimizing Planning and Replenishment.

With Integrated Planning Solutions, you can anticipate demand before it happens—so you can adapt to constantly changing customer needs. Our solutions address today's challenges with forecasting, planning and replenishment capabilities. By combining proven forecasting techniques with sophisticated demand cleansing and day-of-the-week and seasonal profiling tools, you can generate the highest return on inventory investment and ensure you have a plan that will help you meet your goals.

Pleasing your customers and increasing revenue are undoubtedly at the top of your company's priority list. As you strive to fulfill these goals, Manhattan Associates' Integrated Planning Solutions can help you balance supply and demand by optimizing planning and replenishment. Reducing inventory, increasing fill rates and improving customer service are just a few of the benefits you can experience with Integrated Planning Solutions.

Integrated Planning Solutions include:

- Advanced Planning comprised of:
  - Financial Planning
  - Store Clustering
  - Assortment Planning
  - Item Planning
  - Catalog Planning
  - Web Planning
  - Promotion Planning
- Demand Forecasting comprised of:
  - Demand Forecasting
  - Promotion Forecasting
- Replenishment comprised of:
  - Replenishment
  - Vendor Managed Inventory

Integrated Planning Solutions enable you to:

- Achieve service-level goals with the optimal inventory investment, increasing sales through reduced stock-outs and reducing working capital requirements
- Respond to business changes quickly by synchronizing supply and demand changes across your entire supply chain
- Increase productivity by automating tasks, using exception-based approach and viewing all planning data in one place

Advanced Planning

Satisfy Demand and Increase Profits with Powerful Planning Tools.

Each of your selling channels presents challenges which require specifically tailored solutions. With Manhattan Associates' **Advanced Planning**, you can build top-down and bottom-up plans and assortments based on product, location, event and vendor information by channel and across channels—ensuring you not only make profitable decisions but at the same time keep your customers satisfied.

Built by planners, for planners, our Advanced Planning solutions are flexible and intuitive to allow you to plan the way you want. They are as easy to use as a spreadsheet—but powerful enough to handle high volumes of data and complex calculations in a multi-dimensional model.

With Manhattan Associates' Advanced Planning solutions, you can drive your business from strategic business plans through to financial, operating, assortment and promotional plans for each selling channel. These integrated solutions provide a variety of planning capabilities to support "what if" scenario modeling for effective merchandising decisions. The only solutions to combine the art and science of merchandise planning for today's

multi-channel environment, Advanced Planning drives revenue and margin opportunities at the earliest stages in your supply chain planning cycle and allows you to adjust and reforecast performance in season as trends emerge.

Our **Advanced Planning Solutions** include:

- Financial Planning
- Store Clustering
- Assortment Planning
- Item Planning
- Catalog Planning
- Web Planning
- Promotion Planning

Demand Forecasting

Anticipate Demand Before It Happens.

To be successful in today's demand-driven supply network, you need to find the right balance between having what your customers want and the cost of carrying that inventory. Without enough, you could have backorders, cancellations and unsatisfied customers. But if you have too much, you waste time, money and space with overstocks and are forced to take markdowns to get rid of the extra inventory.

With Manhattan Associates' **Demand Forecasting** and Promotion Forecasting solutions, you don't have to just react to the needs of customers and hope you have the right inventory. You are able to anticipate demand before it happens and prepare for what is ahead.

Demand Forecasting

- Generate and maintain forecasts at different levels of product and location
- Provide appropriate forecast methods for merchandise planning versus optimized replenishment
- Initialize a promotional forecast using raw historical sales, eliminating the need for pre-existing promotion history
- Optimize demand history through demand cleansing and seasonal profiling
- Improve productivity by reducing user interaction to automatically detect and self-correct problems through Advanced Exception Management

Replenishment

Increase Inventory Turns, Optimize Service Levels and Reduce Inventory.

Inventory serves as the largest investment for manufacturers, distributors and retailers. So it is no wonder you are constantly looking for ways to reduce the amount you carry—and still have what your customers want.

With multi-echelon inventory optimization, Manhattan Associates' **Replenishment** solution handles forecasting and replenishment of multi-tiered and multi-channeled distribution networks—all in one place—giving you the visibility you need across your entire operation.

At the heart of our Replenishment solution is a state-of-the art statistical forecasting engine that combines proven forecasting techniques with sophisticated demand cleansing, day-of-the-week and seasonal profiling tools. Together these boost your return on investment—increasing inventory turn, optimizing service levels and reducing inventory.

Replenishment

- Improves customer service goals by optimizing the deployment of inventory across the distribution network
- Reduces inventory and maximizes customer service levels by optimizing the distribution of safety stock
- Improve responsiveness to changes in customer demand so your customers get what they want, when they want it
- Redistributes products when there are inventory imbalances
- Supports advanced functionality with add-on modules such as Capacity Constrained Ordering, Investment Buying, Push Allocations, Slow Mover Management and Advanced Reporting

Supply Chain Execution

- Distributed Order Management
- Warehouse Management
- Slotting Optimization
- Labor Management
- Yard Management
- Transportation Management
- Carrier Management
- Trading Partner Management

- Reverse Logistics Management
- RFID Solutions

Distributed Order Management

Balance Supply and Demand in Real Time.

With orders coming from an increasingly diverse set of channels and inventory moving through a heavily distributed supply base, you face growing complexity on both sides of the order fulfillment equation.

Manhattan Associates' **Distributed Order Management** solution allows you to have a global view of supply and demand, enabling you to meet time and delivery demands as well as your customers' expectations. Unlike most traditional order management applications, Distributed Order Management focuses on cross-channel order prioritization, order fulfillment visibility and inventory sourcing and allocation—from any location along the supply chain.

Built from the ground up as a services-oriented, easily integrated order management solution, Distributed Order Management can enhance existing order management systems or function as a standalone system. Either way, the rules and workflow engines at the core of this solution allow businesses to adapt quickly to new order channels, changing business units and shifts in the supply base.

Distributed Order Management

- Allows continuous prioritization of orders from all demand channels
- Facilitates real-time order promising (ATP) and allocation, leveraging on-hand, in-transit and on-order inventory throughout the supply network
- Orchestrates flow-through fulfillment
- Enables proactive rerouting of in-transit inventory based on back orders, changing demand forecasts and current inventory positions
- Supports global order and inventory visibility

Warehouse Management

Improve Performance at Every Stage of the Fulfillment Process.

Your warehouse plays a key part in ensuring that your company meets its productivity goals. With our **Warehouse Management** solution, you can move goods and information through your warehouse at maximum speed. And, with our Billing Management solution, your warehouse can become more profitable by eliminating hidden costs that can add up over time.

Warehouse Management enhances inventory management by decreasing inventory levels, improving order fulfillment and reducing order cycle time. Designed to control all of your warehouse activities, this powerful solution allows you to track every unit down to the lowest level of detail—country of origin, lot number, serial number and date code.

Warehouse Management

- Improves warehouse facility layout
- Increases inventory accuracy
- Increases order fulfillment and accuracy
- Calculates item velocity to ensure inventory is optimally located
- Provides picking, packing and replenishment tools
- Increases billing accuracy and boosts profitability
- Identifies hidden costs of doing business

Slotting Optimization

Improve Workforce Efficiency through Optimal Facility Layout.

To achieve optimal productivity in your warehouse, products need to be placed strategically. Manhattan Associates' **Slotting Optimization** solution increases workforce efficiency, shortens order fulfillment cycles and minimizes damage by determining the best place for inventory in your warehouse.

Before you actually slot goods, our Slotting Optimization solution calculates ROI of the new position to ensure that the time and labor you invest pays off. Using a genetic algorithm, the solution considers millions of move combinations against user configured strategies to determine the optimal layout.

Once your pickline is at peak productivity, the daily maintenance feature keeps it that way—regardless of how your inventory changes from day to day or month to month.

Slotting Optimization

- Determines the best location for every product in your facility
- Organizes your facility to decrease bottlenecks and product damage
- Adjusts slotting criteria as products, locations and demand change
- Prevents worker fatigue and accidents
- Maintains peak productivity of your pick line
- Integrates with Labor Management for optimal cost-efficiency

Labor Management

Boost Employee Performance and Productivity.

Labor can be an expensive resource for your company. By tracking associate time, calculating estimated task duration and proving synchronized reporting on employee performance, Manhattan Associates' Labor Management solution optimizes your warehouse workforce. **Labor Management** provides reports for all levels—and, when integrated with existing warehouse management solutions, managers and employees can use it to obtain performance expectations and review results.

Labor planning—a forecasting tool—projects the number of full-time and temporary employees necessary to complete work. This allows managers to improve labor efficiency, reduce overtime hours and increase customer service levels. Labor monitoring offers updated labor requirements and provide visibility into what work has been assigned and completed, as well as what work remains. That way, you gain flexibility in managing the workforce and ensure that your personnel are focusing on the highest priorities.

Labor Management

- Records all activities while an employee is on the clock
- Monitors performance levels in real time
- Provides visibility to fair performance targets
- Views workload across functional areas and zones
- Measures actual productivity against expected performance
- Calculates pay-for-performance data
- Provides reports on productivity based on supervisor, employee, warehouse or team performance
- Applies activity-based compensation criteria to align hourly pay rates and incentives with performance results

Yard Management

Gain Complete Visibility into Your Yard.

Manhattan Associates' **Yard Management** solution gives you visibility beyond the four walls of your warehouse by providing yard and dock door management capabilities. This solution handles all of your shipping and receiving requirements by creating plans and managing inventory in the yard.

Yard Management schedules appointments and tracks trailer position and status. It tracks task completion information so you can perform inquiries, run reports and review real-time information. Your carriers and suppliers can also self-schedule appointments or

requests through electronic data interchange (EDI) or a Web interface—allowing you to turn loads more quickly and efficiently.

At the dock door, Yard Management manages the timely arrival of loads and ensures that trailers unload at the right dock door at the right time. Through guard check-in and check-out procedures, you benefit from the efficient scheduling and management of appointments to reduce load and unload wait times—and reduce the risk of violating Hours of Service regulations.

Yard Management

- Manages goods in the yard in real time through a graphical display
- Plans and executes loads
- Allows carrier self-scheduling via electronic data interchange (EDI) or the Web
- Increases visibility into inbound and outbound loads
- Provides guard check-in and check-out functionality to maintain security and reduce unnecessary wait times

Transportation Management

Run an Efficient and Profitable Transportation Network.

With the increasing complexities of moving goods around the globe, you need transportation strategies that work across all modes—air, ocean, rail and surface. How can you run a successful transportation network—while keeping costs down and providing great service to your customers?

Manhattan Associates' **Transportation Management** solutions provide everything you need to automate your transportation network—whether inbound or outbound, private fleet or common carrier. Transportation Management solutions integrate transportation procurement, planning and execution so you can run a more efficient transportation network—and increase overall profitability.

Transportation Management solutions include:

- Transportation Procurement
- Transportation Planning & Execution
- Fleet Management
- Carrier Management
- Audit, Payment & Claims

Whatever you're long-term goals, our solutions will enable you to develop an optimal transportation plan to run your day-to-day operations more efficiently—and with better results. You'll be well-equipped to make the best resource-to-shipment assignments, adapt quickly to changes and events in real time and strengthen communication with your trading partners and carriers.

Transportation Management

- Reduces transportation management time and costs
- Increases profit margins and overall profitability
- Integrates transportation procurement, planning and execution
- Improves on-time deliveries and customer service
- Enables global supply visibility and maximum efficiency for competitive advantage
- Strengthens relationships with suppliers and carriers
- Enables the movement of goods across modes and around the globe

Carrier Management

Gain Control over Your Network.

Change is constant in the transportation industry. With Manhattan Associates' **Carrier Management** solutions, you can manage and respond to current issues in the transportation industry such as escalating fuel prices, federal regulations and customer demand.

Carrier Management

- Targets most profitable freight
- Constructs optimal schedules and driver tours
- Improves load averages and driver utilization
- Calculates true cost of serving customers
- Boosts on-time delivery, customer service and profitability
- Enables compliance with Hours of Service regulations

Logistic engineering

Logistic Engineering deals with the science of Logistics. Logistics is about the purchasing, transport, storage, distribution, warehousing of raw materials, semi-finished/work-in-process goods and finished goods. Managing all these activities efficiently and effectively for an organisation is the main question at the back of the mind of any logistic engineer.

Different performance measures are used to examine the efficiency of an organisation's logistics. The most popular and widely used performance measure is the landed cost. The

landed cost is the total cost of purchasing, transporting, warehousing and distributing raw materials, semi-finished and finished goods.

Another performance measure equally important is the end customer fillrate. It is the percentage of customer demand which is satisfied immediately off-shelf. Logistics is generally a cost-center service activity, but it provides value via improved customer satisfaction. It can quickly lose that value if the customer becomes dissatisfied. The end customer can include another process or work center inside of the manufacturing facility, a warehouse where items are stocked or the final customer who will use the product.

Another much more popular derivative and a complete usage of the logistic term which has appeared in recent years is the supply chain. The supply chain also looks at an efficient chaining of the supply / purchase and distribution sides of an organisation. While Logistics looks at single echelons with the immediate supply and distribution linked up, supply chain looks at multiple echelons/stages, right from procurement of the raw materials to the final distribution of finished goods up to the customer. It is based on the basic premise that the supply and distribution activities if integrated with the manufacturing / logistic activities, can result in better profitability for the organisation. The local minima of total cost of the manufacturing operation is getting replaced by the global minima of total cost of the whole chain, resulting in better profitability for the chain members and hence lower costs for the products.

"Logistics Engineering" as a discipline is also a very important aspect of system engineering that includes reliability engineering. It is the science and process whereby reliability, maintainability, and availability are designed into products or systems. It includes the supply and physical distribution considerations above as well as more fundamental engineering considerations. For example, it we want to produce a system that is 95% reliable (or improve a system to achieve 95% reliability), a logistics engineer understands that total system reliability can be no greater than the least reliable subsystem or component. Therefore our logistics engineer must consider the reliability of all subcomponents or subsystems and modify system design accordingly. If a subsystem is only 50% reliable, one can concentrate on improving the reliability of that subsystem, design in multiple subsystems in parallel (5 in this case would achieve approximately 97% reliability of that subsystem), purchase and store spare subsystems for rapid change out, establish repair capability that would get a failed subsystem back in operation in the required amount of time, and/or choose any combination of those approaches to achieve the optimal cost vs. reliability solution. Then the engineer moves onto the next subsystem.

Logistics Engineers work with complex mathematical models that consider elements such as Mean Time Between Failures (MTBF), Mean Time To Failure (MTTF), Mean Time to Repair (MTBR), Failure Mode and Effects Analysis(FMEA), arcane statistical distributions, queing theory, and a host of other considerations. Obviously, logistics engineering is a complex science that considers tradeoffs in component/system design, repair capability, training, spares inventory, demand history, storage and distribution

points, transportation methods, etc., to ensure the "thing" is where it's needed, when it's needed, and operating the way it's needed all at an acceptable cost.

Supply Chain reengineering (case study)

REM Associates of Princeton, Inc. recently worked with a major private label healthcare supplier to the retail market to completely re-engineer their supply chain from procurement through delivery and customer service including, information systems and data management. This program began with an assessment of each of the supply chain elements and included implementation of recommended changes working alongside company managers and staff.

Supply chain re-engineering objectives were to:

- Improve product and customer demand forecasting, including promotional activity
- Reduce operational costs of supply chain activities
- Improve service to all customers, including retail, wholesale, and military
- Reduce inventories and related investments at all levels, including raw materials, WIP, and finished goods.

Key issues indicating the need for a re-engineering effort were:

- Approximately four inventory turns per year.
- Customer Service in terms of on-time and complete shipments below 70%
- Lack of good forecasting, including inability to use available POS data
- Production Plans beyond capacity resulting in the purchase of excess raw materials and components
- Out-of-stock position at a major customer over 20%
- High risk of loosing major customer, accounting for over 25% of total business sales.

Results of this work:

- Inventories reduced by over 35% - over $40 million
- Inventory accuracy improved from less than 80% to over 95%
- Customer service in terms of on-time and complete over 96%
- Major customer in stock position over 97%
- Ownership and responsibility for both forecasting and inventory assigned to key managers
- Re-organization of key management functions and responsibilities significantly improved communications, decision making, and timeliness of management actions
- Total supply chain operating costs reduced in excess of 15%

- Major improvements in static and dynamic data for management tools and decision making
- Production plans were within capacity constraints.

Major areas of concentration resulting in significant improvements were:

Inter-Company Communications:

The culture in this company was to solve customer out-of-stock problems by sending e-mails. Once the e-mail was sent, the "sender" felt that the problem was solved. "It's off my desk," was the thinking. By implementing daily, now weekly, one-hour meetings, with senior individuals, to resolve out of stock and manufacturing issues, the out-of-stock position has greatly improved.

Organization:

No ownership existed for either product forecasting or inventory management. Several forecasts were in place including production, sales, and finance. Substantial amounts of excess inventories existed, including overstocks due to forecasts and production plans beyond capacity. Establishing ownership of both forecasting and inventories provided management with increased controls and focus on accuracy and levels.

Production Planning:

This company is using MPRII software that is approximately 15 years old. Since installation, several new manufacturing sites have been added; however, the static data had not been updated in many years. Less than 50% of products manufactured were produced on the primary machinery. Production plans were not based on realistic capabilities. Overtime was being worked when not required, and not being worked when required.

A six-month effort was undertaken to update all static data. Various programs were modified to provide monthly feedback to manufacturing regarding primary resource utilization and equipment run rates. Audit processes were developed to verify static data for all purchased items.

A monthly production-planning meeting was initiated for senior management to review production plans within capacity constraints and approve operations schedules for the next three months.

Inventory Accuracy:

Inventory accuracy was well below 80%. For an MRPII system to be effective, inventory accuracy of 95% is required. With 90% accuracy the system can be functional with significant manual intervention. With inventory accuracy below 85% the system cannot be effective.

A cycle counting program was initiated, as well as new processes for dealing with partial lots, improving inventory accuracy to a level well above 95%.

Inventory Management:

The lack of ownership of forecasting coupled with the MRP systems issues led to extremely high inventory levels consisting of excess raw materials, WIP, and finished product. Inventory segmentation, with focus on key items and excesses, provided the opportunity to reduce significant amounts of over stocks and the ability to turn inventories to more closely match the needs of the business. This coupled with improved management tools and processes produced significant reductions in total working capital and operating costs.

An excess inventory reduction blitz converted excess inventories to cash and/or usable storage space. By enlisting senior management support and focusing on the most significant excess, 70% of the excess was reduced in less than six months.

Systems Improvements:

Numerous systems improvements were recommended within the existing system and modules were implemented that were licensed, but not in use. These improvements would ensure that the production requested from each of the six manufacturing sites could be achieved within the time period requested.

This project was extremely successful resulting in enthusiastic approval by senior management, their board of directors, and key investment bankers. If your company has any of these issues/symptoms please contact REM Associates for an evaluation of what supply chain re-engineering could accomplish for your organization.

Warehousing

A **warehouse** is a commercial building for storage of goods. Warehouses are used by manufacturers, importers, exporters, wholesalers, transport businesses, customs, etc. They are usually large plain buildings in industrial areas of cities and towns. They come equipped with loading docks to load and unload trucks; or sometimes are loaded directly from railways, airports, or seaports. They also often have cranes and forklifts for moving goods, which are usually placed on ISO standard pallets loaded into pallet racks.

Some warehouses are completely automated, with no workers working inside. The pallets and product are moved with a system of automated conveyors and automated storage and retrieval machines coordinated by programmable logic controllers and computers running logistics automation software. These systems are often installed in refrigerated warehouses where temperatures are kept very cold to keep the product from spoiling, and

also where land is expensive, as automated storage systems can use vertical space efficiently. These high-bay storage areas are often more than 10 meters high, with some over 20 meters high.

The direction and tracking of materials in the warehouse is coordinated by the WMS, or Warehouse Management System, a database driven computer program. The WMS is used by logistics personnel to improve the efficiency of the warehouse by directing putaways and to maintain accurate inventory by recording warehouse transactions.

Traditional warehousing has been declining since the last decades of the 20th century with the gradual introduction of Just In Time (JIT) techniques designed to improve the return on investment of a business by reducing in-process inventory. The JIT system promotes the delivery of product directly from the factory to the retail merchant, or from parts manufacturers directly to a large scale factory such as an automobile assembly plant, without the use of warehouses. However, with the gradual implementation of offshore outsourcing and offshoring in about the same time period, the distance between the manufacturer and the retailer (or the parts manufacturer and the industrial plant) grew considerably in many domains, necessitating at least one warehouse per country or per region in any typical supply chain for a given range of products.

Recent developments in marketing have also led to the development of warehouse-style retail stores with extremely high ceilings where decorative shelving is replaced by tall heavy duty industrial racks, with the items ready for sale being placed in the bottom parts of the racks and the crated or palletized and wrapped inventory items being usually placed in the top parts. In this way the same building is used both as a retail store and a warehouse.

Modern warehouses are also used at large by exporters/manufacturers as an point of developing retail outlets in a particular region or country. This concept reduces the end cost of the product to the consumer and thus enhance the production sale ratio. Warehousing is an age old concept which can be used as sharp tool by original manufacturers to reach out directly to consumers leaving aside or bypassing importers or any other middle agencies or person.

Warehouse management

The productivity of your distribution centers is a key factor in the overall success of your supply chain. Among the number of benefits in effective warehouse management are significant increases in revenue and deep cuts in costs. Because of a warehouse's many complicated business processes, there are several ways to improve productivity and streamline processes. If you want to take your warehouse operations beyond basic picking, packing and shipping —Manhattan Associates ' Warehouse Management solution can offer you the functionality you need. Warehouse Management —through its broad and rich functionality —enables faster and more efficient flow of goods through your warehouse. To gain a competitive advantage, your company must consider several

factors — customer demand, vendor compliance and multi-channel distribution. By analyzing your facility layout and the productivity of your workforce, Manhattan Associates' Warehouse Management solution simplifies operations so that you can meet performance objectives and better please your customers.

Gain Insight into Your Inventory, Operational Processes and People.

Experience dramatic results, experience quick deployment and lower total cost of ownership by implementing Warehouse Management or Billing Management.

Warehouse Management

•Provides optimal inventory control by improving warehouse facility layout
•Reduces transportation and shipping costs by aggregating orders
•Improves order fulfillment and accuracy
•Streamlines inefficient processes, redundant effort and excess inventory
•Improves workload balancing and planning
•Simplifies the exchange of information and the movement of goods within the warehouse and yard in real time

Billing Management

•Provides activity-based billing
•Increases billing accuracy and boosts profitability
•Tracks all inventory handling, storage and fulfillment activities by unit or client
•Affixes charges to all internal or client-driven activities
•Applies billing rules at the client level
•Provides invoice generation and host/ERP integration

British American Tobacco

About us

Our goals are to grow our brands and the value of the business, to improve productivity and to embed the principles of corporate responsibility around the Group. **Paul Adams, Chief Executive**

We are the world's second largest quoted tobacco group by global market share, with brands sold in more than 180 markets.

With over 300 brands in our portfolio, we make the cigarette chosen by one in six of the world's one billion adult smokers. We hold robust market positions in each of our regions and have leadership in more than 50 markets.

In 2006, our subsidiaries enabled governments worldwide to gather over £16 billion a year in taxes, including excise duty on our products, some 8 times the Group's profit after tax.

We have sustained a significant global presence for over 100 years. Our business was founded in 1902 and by 1912 had become one of the world's top dozen companies by market capitalisation

People and factories

Our subsidiary companies produce some 689 billion cigarettes through 52 cigarette factories in 44 countries and have four separate factories in four countries manufacturing cigars, roll-your-own and pipe tobacco.

We employ over 55,000 people worldwide. Our workforce is strongly multi-cultural and we have a devolved structure, with each local company having wide freedom of action and responsibility for its operations. Decisions are made as close as possible to the local stakeholders of each business, within a framework of principles, standards, policies, strategies and delegated authorities.

Operating responsibly

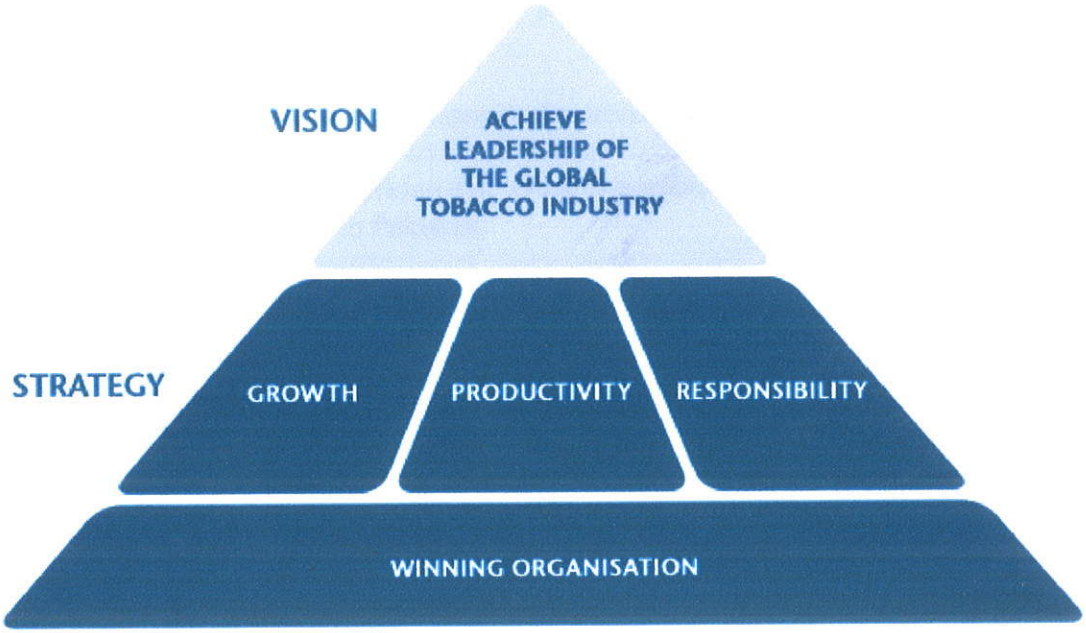
We believe that because our products pose risks to health, it is all the more important that our business is managed responsibly. Responsibility is integral to our strategy and through dialogue with our stakeholders, we are working to pursue our commercial objectives in ways consistent with changing expectations of a modern tobacco business.

Tobacco growing

We are the only international tobacco group with a significant interest in tobacco leaf growing, working with thousands of farmers internationally. Our companies run leaf programmes in 22 countries providing direct agronomy support to farmers if it is not otherwise available, covering all aspects of crop production and environmental best practice. Our companies purchased 456,000 tonnes of leaf in 2006, grown by some 250,000 farmers, and over 80 per cent of it by volume came from farmers and suppliers in emerging economies.

Our strategy

Over the last decade or so, our market share has increased by nearly 50 per cent. We are now the second largest international tobacco Group, accounting for some 17 per cent of the global market.



Pakistan Tobacco Company

PAKISTAN TOBACCO COMPANY

About us

Pakistan Tobacco Company Limited was incorporated in 1947 immediately after partition, when it took over the business of the Imperial Tobacco Company of India which had been operational in the subcontinent since 1905.

We are part of the trans-national British American Tobacco Group, which employs some 90,000 people worldwide and which has a presence in 180 countries. British American Tobacco has a position of market leader in more than 50 countries selling over 300 brands there. In 2004, the Group sold and produced a nearly 16% share of the global market of cigarettes.

PTC is the largest excise tax generator in the private sector in the country. In 2004 alone, PTC paid the government close to Rs.16 Billion in excise and sales taxes. This amounts to over Rs. 50 million per working day. Over one million people are economically dependent on the industry in Pakistan.

Supply chain

Supply chain management is about the efficient movement of goods from supplier to customer premises to achieve the required level of customer service at minimum cost.

The Supply Chain team focuses on continuously improving the Pakistan Tobacco Company's planning processes and the supply and distribution of our materials and products.

Our supply chain comprises the procurement and then the movement of materials, including raw materials for manufacturing that originates from Pakistani or overseas locations.

Then following manufacturing, the further movement or distribution of finished goods throughout Pakistan to the retailers and eventually onto our consumers.

Pakistan Tobacco Company's Supply Chain Function can be further defined as:

· The execution of the internal and external processes for co - ordination of planning, supply, distribution and security of Pakistan Tobacco Company's materials & products.

· From the Supplier of raw materials, through the manufacturing facility to the consumer.

· With the intention of ensuring availability of our product to the consumer at all times.

· At optimal quality, whilst maximizing efficiency and cost effectiveness for all parties involved while ensuring that the product reaches the consumer in the best possible condition.